# Bachelor of Science in Biology: Concentration in Ecology - Quantitative Reasoning Category III/IV and Stretch English

120 Total Units Required  
Minimum Number of Units in the Major: 67

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

## Course Title | Units
--- | ---
### First Semester

**BIOL 230**  
Introductory Biology I (Major Lower-Division Core) | 5
**ENG 104**  
Writing the First Year: Finding Your Voice Stretch I | 3
**MATH 197**  
Prelude to Calculus I (Prerequisite for MATH 226) | 3
GE Area A | 3
GE Area C | 3

Units: 17

### Second Semester

**CHEM 115**  
General Chemistry I: Essential Concepts of Chemistry (Major Lower-Division Core) | 5
**ENG 105**  
Writing the First Year: Finding Your Voice Stretch II (A2) | 3
**MATH 198**  
Prelude to Calculus II (Prerequisite for MATH 226, B4) | 3
**PHYS 111** & **PHYS 112**  
General Physics I and General Physics I Laboratory (Major Lower-Division Core, B1, B3) | 4

Units: 14

### Third Semester

**BIOL 240**  
Introductory Biology II (Major Lower-Division Core) | 5
**MATH 226**  
Calculus I (Major Lower-Division Core, B4) | 4
GE Area D | 3

Units: 16

### Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
</table>

**CHEM 130**  
General Organic Chemistry (Major Lower-Division Core) | 3

Select Two (Major Lower-Division Core): | 8-9

**CHEM 215** & **CHEM 216**  
General Chemistry II: Quantitative Applications of Chemistry Concepts and General Chemistry II Laboratory: Quantitative Applications of Chemistry Concepts | 4

**MATH 227**  
Calculus II | 3
**PHYS 121** & **PHYS 122**  
General Physics II and General Physics II Laboratory | 4

GE Area A | 3

Units: 15

### Fifth Semester

**BIOL 355**  
Genetics (Major Upper-Division Core) | 3
**BIOL 458**  
Biometry (Major Upper-Division Core) | 4

GE Area C - Take Two | 6
GE Area D | 3

Units: 14

### Sixth Semester

**BIOL 337**  
Evolution (Major Upper-Division Core) | 4
**BIOL 525** or **BIOL 630**  
Plant Physiology (Major Upper-Division Core) or Animal Physiology | 3

Major Upper-Division Electives (11–14 Units Total) - Take One | 8
GE Area D | 3
SF State Studies or University Elective | 3

Units: 15

### Seventh Semester

Major Upper-Division Electives (11–14 Units Total) - Take Two to Three | 8
Major Upper-Division Requirement (6–8 Units Total) - Take One | 4
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course) | 3

Units: 16

### Eighth Semester

Major Upper-Division Electives (11–14 Units Total) - Take One | 8
Major Upper-Division Requirement (6–8 Units Total) - Take One to Two | 4-6
Bachelor of Science in Biology: Concentration in Ecology - Quantitative Reasoning Category III/IV and Stretch English

GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course) 3

<table>
<thead>
<tr>
<th>SF State Studies or University Elective - Take Two</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14-18</td>
</tr>
</tbody>
</table>

Total Units 120-127

1. ENG 114 can only be taken if you complete Directed Self-Placement (DSP) and select ENG 114; if you choose ENG 104/ENG 105 through DSP you will satisfy A2 upon successful completion of ENG 105 in the second semester; multilingual students may be advised into alternative English courses.

2. Depending on courses completed through Early Start, students in Pathway/Category III or IV may be required to enroll in a support course to complement their Quantitative Reasoning/B4 requirement. There are multiple course options for this pathway. Before enrolling in a B4 course, students should verify their MATH Pathway/Category in their Student Center (http://cms.sfsu.edu/content/student-center/). Information regarding the courses that correspond with your MATH Pathway/Category can be found on the Developmental Studies Office Website (http://developmentalstudies.sfsu.edu/).

3. QR Category III students with a grade of B or higher in high school pre-calculus in the past year may be able to enroll in MATH 226. Please see a department advisor.

4. To avoid taking additional units, it is recommended that you meet SF State Studies requirements (AERM, GP, ES, SJ) within your GE.

5. GE Areas B2 (Life Science) and B3 (Laboratory Science) are satisfied upon completion of BIOL 240.

6. GE Area B1 (Physical Science) is satisfied upon completion of CHEM 130.

7. Upper-Division General Education, Physical, and Life Sciences (UD-B) is satisfied upon completion of BIOL 355.

8. Major Upper-Division Electives (11-14 units)
   Select 11-14 units upon advisement from the alternates not used in fulfilling the requirements listed above, or any other upper-division Biology courses not specifically excluded for major credit, or any graduate course in Biology.

9. Major Upper-Division Requirement (6-8 units)
   Select 6-8 units on advisement from the following:
   BIOL 482 Ecology (4 units)
   BIOL 490 Ecology of Infectious Diseases (4 units)
   BIOL 529GW Plant Ecology - GWAR (4 units)*
   BIOL 530 Conservation Biology (3 units)
   BIOL 532 Restoration Ecology (3 units)
   BIOL 534 Wetland Ecology (4 units)
   BIOL 577 Ecological and Environmental Modeling (4 units)
   BIOL 580 Limnology (3 units)
   BIOL 582 Biological Oceanography (4 units)
   BIOL 585 Marine Ecology (3 units)
   BIOL 586 Marine Ecology Laboratory (2 units)

* Students are required to complete at least one GWAR course in order to graduate.